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(54) **PHOTOTHERAPY METHOD AND DEVICE**

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,549,639 A 8/1996 Ross
6,171,332 B1 * 1/2001 Whitehurst 607/89
(Continued)

FOREIGN PATENT DOCUMENTS

WO 2004033040 A1 4/2004
WO 2007106856 A2 9/2007

OTHER PUBLICATIONS

Mark D. Shriver et al. "Comparison of Narrow-Bank Reflectance Spectroscopy and Tristimulus Colorimetry for Measurements of Skin and Hair Color in Persons of Different Biological Ancestry". American Journal of Physical Anthropology, vol. 112, No. 1, Apr. 13, 2000, pp. 17-27.
(Continued)

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(57) **ABSTRACT**

A method of biostimulating phototherapy is provided. The method comprises illuminating a subject's body portion (**1**) with light having a first wavelength in the range of 600-900 nm (**17**) and reducing and preventing hyperthermia of the body portion by illuminating the body portion with light having a second wavelength which is at least one of in the range of 400-600 nm and in the range of 900-2500 nm (**19**). Further, a phototherapy device (**21**) is provided which comprises a first light source (**25**) and a second light source (**26**). The first light source is configured to emit light (**17**) having a first wavelength which is in the range of 600-900 nm. The second light source is configured to emit light (**19**) having a second wavelength which is at least one of in the range of 400-600 nm and in the range of 900-2500 nm.

14 Claims, 2 Drawing Sheets